

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2005-0164

WASTE DISCHARGE REQUIREMENTS

FOR  
USECC GOLD LIMITED LIABILITY COMPANY  
SUTTER GOLD MINING COMPANY  
SUTTER GOLD MINING INC.  
U.S. ENERGY CORP  
PROPERTY OWNERS  
FOR  
LINCOLN MINE PROJECT  
CONSTRUCTION OF WASTE PILES AND EXPANDED MINING OPERATIONS  
AMADOR COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Regional Board) finds that:

1. Sutter Gold Mining Company submitted a Report of Waste Discharge (RWD) on 13 October 2004 for expanding operations at its existing underground gold mine to full-scale operations. Additional information to support the RWD has been received periodically through September 2005. At the time the RWD was submitted, Sutter Gold Mining Company was a subsidiary of U.S. Energy Corp. Presently, Sutter Gold Mining Company is a subsidiary of Sutter Gold Mining Inc., of which U.S. Energy Corp. owns 65% of the outstanding shares. Sutter Gold Mining Company owns USECC Gold Limited Liability Company.
2. The Sutter Gold Mining Company owns and operates the Lincoln Mine project, which includes 574 acres of mine claims and land owned by USECC Gold Limited Liability Company as well as a number of other entities (listed in Finding No. 3). These landowners are jointly referred to as the "Property Owners." For purposes of this Order, USECC Gold Limited Liability Company, Sutter Gold Mining Company, Sutter Gold Mining Inc., U.S. Energy Corp., and the Property Owners are jointly referred to as "Discharger."
3. Surface operations at the Lincoln Mine Project include the proposed mill facilities, the 4-acre waste rock pile adjacent to the mill and a proposed waste pile (Surface Fill Unit) and dewatering plant which will be located on a 34-acre parcel and used to dispose of dewatered mill tailings regulated by this Order. The Lincoln Mine project area, including both surface and underground workings, will occupy portions of Section 36, T7N, R10E; portions of Sections 31 and 32, T7N, R11E; and portions of Sections 5 and 6, T6N, R11E, MDB&M as shown in Attachment 1, which is incorporated herein and made part of this Order by reference. The Lincoln Mine project area comprises the following Amador County Assessor's Parcel Numbers (APN):

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2005-0164  
 USECC GOLD LIMITED LIABILITY COMPANY, SUTTER GOLD MINING COMPANY.  
 SUTTER GOLD MINING INC., U.S. ENERGY CORP, PROPERTY OWNERS  
 LINCOLN MINE PROJECT  
 AMADOR COUNTY

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LAND OWNER	APN NO.	ACREAGE
Keystone Mining Co.	08-260-024-502	50.18
USECC Gold Limited Liability Company	08-260-027-501	20.11
Keystone Mining Co.	08-260-030-502	25.38
Koldjeski	15-210-010-01	12.36
Keystone Mining Co.	15-210-017-000	148.39
Littlefield	15-210-023-00	16.99
USECC Gold Limited Liability Company	15-210-042-501	9.09
USECC Gold Limited Liability Company	15-210-043-501	16.11
USECC Gold Limited Liability Company	15-210-044-501	9.08
USECC Gold Limited Liability Company	18-010-001-502	8.13
USECC Gold Limited Liability Company	18-010-002-502	3.61
USECC Gold Limited Liability Company	18-010-003-502	1.78
USECC Gold Limited Liability Company	18-010-004-502	4.14
USECC Gold Limited Liability Company	18-010-006-502	20.43
USECC Gold Limited Liability Company	18-010-007-502	1.8
USECC Gold Limited Liability Company	18-010-008-502	46.68
USECC Gold Limited Liability Company	18-080-008-502	24.52
USECC Gold Limited Liability Company	40-010-003-000	5.05
USECC Gold Limited Liability Company	40-010-007-200	8
USECC Gold Limited Liability Company	40-010-008-000	8.35
Chisholm	40-010-012-000	6.62
Crotty	40-010-013-000	12.26

LAND OWNER	APN NO.	ACREAGE
Chisholm	40-010-018-501	17.5
USECC Gold Limited Liability Company	40-010-018-502	17.5
USECC Gold Limited Liability Company	40-010-019-502	1.82
USECC Gold Limited Liability Company	40-010-023-501	32.65
USECC Gold Limited Liability Company	40-010-024-501	3.33
USECC Gold Limited Liability Company	40-020-007-000	8
Swift	40-030-087-501	34.42
Total Acreage		574.28

4. Waste Discharge Requirements (WDRs) Order No. 99-035 currently regulates the land application of treated groundwater pumped from the mine. WDRs Order No. 99-035 is inadequate for the expanded mine operations because while the Discharger proposes to continue to collect mine drainage, it will also collect leachate from dewatered mill tailings that will be discharged to the underground workings, as allowed by this Order. The treatment and discharge of the leachate is not regulated by WDRs Order No. 99-035. Therefore, the Discharger is required to submit a Report of Waste Discharge to update WDRs Order No. 99-035.
5. This Order includes specifications for the proposed mining operations; the construction of a Waste Rock Pile and a Surface Fill Unit for disposal of dewatered mill tailings; the encapsulation of dewatered mill tailings underground; and the monitoring of both surface and groundwater in the area of the Stringbean Decline (i.e., the underground workings), the Waste Rock Pile, and around the proposed Surface Fill Unit.
6. The underground gold mine and the processing facilities at the Lincoln Mine project will generate both liquid and solid waste streams that could pose a threat to water quality if not managed properly. The underground mining will remove highly mineralized ore veins along with some of the surrounding host rock. Following the blasting, the newly fragmented ore and host rock will be loaded into carts for transportation. The ore will be transported to two lined ore stockpiles near the mill. The host rock will be transported to the existing Waste Rock waste pile near the mill. The ore will then be processed in the mill and the high-grade ore will be concentrated for metals separation at an off-site facility. The remaining tailings from the processed ore will be separated based on size for two different disposal procedures. The finer mill tailings (less than 325 mesh) will be conveyed through a pipeline to the Surface Fill Unit (waste pile) where they will be dewatered prior to discharge to the waste pile. The coarser mill tailings (greater than 325 mesh) will be

drained and mixed with 5% Portland cement slurry as a binder and discharged to the underground workings as an engineered structural support in the excavation from which the ore has been extracted (stope) by appropriate backfilling methods. The Discharger will recycle filtrate from dewatering the enriched ore and both the coarse and fine tailings as process water for the mill operations.

7. This Order allows the discharger to use binders other than Portland cement to mix with the coarser mill tailings, as long as those binders have equivalent properties (hydraulic conductivity, stabilizer, etc.) and the Executive Officer approves the use.
8. The processing of the high-grade ore will be at a facility outside the State of California.
9. The Discharger proposes to start milling ore at 300 tons per day, and expand to 500 tons per day. The milling process will require an estimated 7,200 gallons of process water to charge the mill circuit initially. The Discharger proposes using water from the mine to supply the initial and process make-up water demands of the mill. Municipal water from the City of Sutter Creek would be used to supplement on-site resources.

### WASTE CHARACTERIZATION

10. Nine samples of waste rock were analyzed for acid-base potential. The results ranged from 25.4 to 184 tons of  $\text{CaCO}_3$ /1000 tons. These results, and the discharger's evaluation, show that the waste rock from the underground mining and the processed mill tailings should not be acidic.
11. Based on Title 22 analytical testing, none of the analyte results exceeded hazardous waste total threshold limit concentrations or soluble threshold limit concentrations, except arsenic. Arsenic exceeded the soluble threshold limit concentration limits set forth in Title 22. The Title 22 analysis uses citric acid for the extraction, which is not appropriate in this case since the waste appears to be non-acid generating. When analyzed with deionized water, no soluble concentration exceeded the regulatory limits of Title 22.
12. Gold deposits in the California Mother Lode are associated with sulfide ore bodies containing elevated metals such as arsenic, nickel, and selenium. Dewatering of mines, and moving ore and wall rock to the surface environment, exposes (a) the underground workings, (b) the surrounding rock formations, and (c) the mined material to oxygen. This can cause the sulfide minerals to oxidize, making the associated metals soluble and producing salts such as sulfate. These metals and salts are then available to dissolve into water where they can pose a significant threat to groundwater and surface water quality if not properly managed. Because of the time it takes for sulfide minerals to oxidize and the extended water contact time at the mine, the standard analyses completed as part of the RWD do not necessarily accurately represent the threat to water quality. However, based on February 1999 U.S. EPA document "*Characterization of Mine Leachate and the Development of a Ground-Water Monitoring Strategy for Mine Sites*," and on impacts seen at other mines in the Mother Lode, the mining and mine waste at the Lincoln Mine project could or will produce nonhazardous soluble pollutants at concentrations which exceed water quality objectives.

13. California Code of Regulations Title 27 (Title 27) defines mining wastes and classifies mining wastes into three groups. Mining waste includes overburden, natural geologic materials that have been removed or relocated but have not been processed (i.e., waste rock), and the solid residues, sludges, and liquids from the processing of ores and mineral commodities. "Group B mining waste" is defined in Title 27 as a mining waste that consist of, or contains, nonhazardous soluble pollutants at concentrations which exceed water quality objectives for, or could cause degradation of, waters of the state. "Group C mining wastes" are wastes from any discharge which would be in compliance with the applicable water quality control plan, including water quality objectives, other than turbidity.
14. Based on waste characterization described in the above Findings, the discharge of processed mill tailings could pose a significant threat to water quality. Therefore, residual tailings and solid waste from the milling process (including both the coarse and fine tailings (greater than and less than 325 mesh waste from the milling process) are classified as a 'Group B' mining waste and as such must be discharged to a Group B mining unit as required by Title 27. The host rock (waste rock) is classified as Group B waste and can be discharged to the lined Waste Rock pile. Based on monitoring data collected under this Order, the Discharger may later request the waste to be reclassified.
15. The expanded mine operations proposed by the Discharger will continue to generate mine waters (which are currently collected and treated prior to discharge in accordance with the requirements of WDRs Order 99-035). In addition to the mine water, the proposed operations will generate liquid waste streams from three sources: the filtrates from the milling process, leachate from the Surface Fill Unit, and leachate from the mill tailings discharged to the underground workings. The milling process will generate three filtrates including those generated from dewatering the enriched ore, and from dewatering both the coarse and fine mill tailings prior to discharge to the Surface Fill Unit or the underground workings. The Discharger proposes to recycle filtrates from the milling process into the process water for the mill. Like the existing mine water collected, treated and discharged by the Discharger, these additional liquid wastes from the expanded operation may or will contain salts and soluble pollutants at concentrations that can pose a threat to water quality or cause degradation of waters of the state when not properly managed. Therefore, the Discharger is required to submit a Report of Waste Discharge to update WDRs Order No. 99-035.

### **SITE DESCRIPTION**

16. The Lincoln Mine project is within the western Mother Lode gold district of the Sierra Nevada Mountain Range. The local relief of the project area is approximately 400 feet, which is an estimate of the change in elevation from above the proposed Surface Fill Unit (Group B Waste Pile) to the lowest point beneath the mill area. The present underground mine workings consist of the Stringbean Decline, a currently 2,850 foot long tunnel that is 12 feet high by 15 feet wide a 12% decline. From this decline, approximately 1,700 feet of tunnels branch out towards areas where numerous exploration holes have been drilled.

17. The geology of the Lincoln Mine project is characterized by a steeply dipping to vertical sequence of mafic metavolcanic and metasedimentary rocks of the Upper Jurassic Mariposa Formation. These rocks have been cross-cut by gold-bearing quartz ankerite veins. Localized shear zones structurally control the location and distribution of these veins. The three lithologic units near the decline consist of a basal black carbonaceous slate unit, overlain by greenstone of the Brower Creek Volcanics unit of the Mariposa Formation, and then by a highly fractured, thinly bedded black slate.
18. The steeply east dipping isoclinal folded rocks underlying the Lincoln Mine project are cut by a series of northwest trending (55-65 degrees) gold-bearing quartz ankerite veins. The ankerite fills branching and splaying shears and fractures of the Gold Fault Zone. This fault zone is located west of the Melones Fault Zone which generally separates the Paleozoic metamorphic rocks to the east from the Jurassic rocks located west of the Melones fault.
19. Much of the gold mineralization occurs as grains of free gold that are commonly associated with sulfide minerals. The sulfide minerals are present in concentrations of 1-2% in the veins. Of the sulfides, pyrite and arsenopyrite are the most abundant. The silver to gold ratio is low and the purity of the gold is greater than 800 fine.
20. The closest fault with recently recorded seismic activity is the Foothills Fault System. In the site vicinity, the Foothills Fault System is not a known Holocene fault. However, northwest of the Lincoln Mine project near Oroville, a branch of the Foothills Fault System was the site of historic activity. In 1975 the magnitude 5.7 Oroville earthquake occurred along a branch of the Foothills Fault System approximately 80 miles to the northwest of the Lincoln mine project. The Foothills Fault System is a broad, complex zone of branching faults. In the project vicinity, the Foothills Fault System is a broad zone encompassing the Bear Mountains fault to the west and the Melones fault on the east. The Lincoln Mine project site lies within the eastern portion of the northerly trending Foothills Fault System near the Melones fault. The California Geological Survey has concluded there is insufficient evidence to consider the Foothills Fault System active in the Sutter Creek area as there is no documented displacement in Holocene time. The maximum magnitude earthquake for the Foothills Fault System is a magnitude 6.5 earthquake which could result in peak horizontal ground accelerations of 0.5 g.
21. Land uses within 1,000 feet of the project area include pasture lands, and commercial and residential structures.
22. The Lincoln Mine project area receives an average of 30.97 inches of precipitation per year as measured at the Sutter Hill Ranger Station. The elevation of the station is approximately 1591 feet above mean sea level, while the Lincoln Mine project area elevation ranges from 1200 to 1500 feet above mean sea level. The mean pan evaporation is 68.03 inches per year as measured at the Jackson 1NW Station.

23. The 100-year, 24-hour precipitation event is estimated to be 4.25 inches, based on Department of Water Resources' bulletin entitled Rainfall Depth-Duration-Frequency for California, revised November 1982, updated August 1986.
24. The proposed mill facility, Waste Rock Pile and Surface Fill Unit are not within a 100-year flood plain based on detailed geomorphic and geologic studies. The Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps are not available for the Lincoln Mine project area.
25. There are 26 known domestic or agricultural groundwater supply wells within one mile of the site.
26. Adjacent to the mill site, the Discharger maintains an aboveground, 10,000-gallon, diesel storage tank that is surrounded by a 15,000-gallon secondary containment wall. This tank is regulated by the Aboveground Storage of Petroleum Act under Chapter 6.67, of the Health and Safety Code, Sections 25270 through 25270.13.

### **SURFACE AND GROUND WATER CONDITIONS**

27. The *Water Quality Control Plan for the California Regional Water Quality Control Board, Central Valley Region, 4<sup>th</sup> Edition* (hereafter Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin.
28. Surface water drainage from the Lincoln Mine is to unnamed tributaries of Amador Creek to the northeast and Sutter Creek to the southwest. Sutter Creek is about 1/3 mile to the south of the Lincoln Mine project. Surface water from the proposed Surface Fill Unit drains to Whiskey Gulch which in turn drains to Amador Creek. Amador Creek flows into Dry Creek, which flows into Sutter Creek. Sutter Creek is a tributary of the Mokelumne River.
29. The beneficial uses of the Mokelumne River (between its source and Pardee Reservoir), as specified in the Basin Plan, are municipal and domestic supply, hydropower generation, water contact recreation, non-contact water recreation, warm freshwater habitat, cold freshwater habitat, migration of aquatic organisms, spawning, reproduction, and/or early development, and wildlife habitat.
30. Numerous springs are located above the footprint for the proposed Surface Fill Unit. These springs appear to be controlled by lithology. Surface water from precipitation percolates through permeable volcanic agglomerates of the Mehrten Formation that cap some local hilltops. The water then penetrates towards the base of the Mehrten Formation which includes less permeable siltstones and claystones. Infiltrating water becomes perched along the contact with the less permeable lower Mehrten. Once the percolating water encounters the less permeable materials it moves along the contact until discharging at the ground surface as springs and seeps.
31. Groundwater beneath the site occurs in the weathered bedrock and to lesser extent in fractures within the unweathered bedrock. The weathered zone ranges from ground surface to 30 feet in

depth. In some areas the weathered zone does not exist and bedrock is exposed at the surface. Bedrock fracture intensity varies within the unweathered bedrock, but generally the rock of the Brower Creek Volcanics in the vicinity of the Stringbean Decline becomes quite massive below 100 feet (less fractures). Based on groundwater elevation measurements, the groundwater flow generally follows the topography. The hydraulic conductivity is influenced by rock type and the nature and degree of the bedrock fractures that are predominantly oriented northwest to southeast. The measured hydraulic conductivity of the material underlying the proposed Surface Fill Unit ranges between  $2 \times 10^{-3}$  cm/sec and  $7 \times 10^{-6}$  cm/sec. The measured hydraulic conductivity of the native rock materials in the area of the Stringbean Decline ranges between  $7 \times 10^{-5}$  cm/sec and  $6.5 \times 10^{-8}$  cm/sec. The average groundwater gradient is approximately 0.12 feet per foot. The average groundwater velocity is approximately 40 feet per year.

32. The designated beneficial uses of the groundwater, as specified in the Basin Plan, are domestic and municipal, agricultural, and industrial supply.

## **GROUNDWATER MONITORING**

### **Waste Rock Pile**

33. The proposed Waste Rock Pile will store mine material prior to milling. The Discharger has yet to install an approved groundwater monitoring system for the waste rock pile. Therefore, this Order requires the Discharger to install and maintain a groundwater monitoring system to comply with Subchapter 3 of Title 27, as well as establish water quality protection standards prior to discharge to the Waste Rock Pile.

### **Group B Waste Pile (Surface Fill Unit)**

34. The Discharger will construct a waste pile for dewatered mill tailings (Group B mine waste) in a small valley about half a mile east of the underground workings of the Stringbean Decline. The proposed Surface Fill Unit will contain mine waste material from the milling process smaller than a 325 mesh sieve. The Discharger has installed three monitoring wells in the vicinity of this proposed waste pile (Wells MWA, MWB and MWC) to determine groundwater flow direction, velocity and water quality. These monitoring wells will also be used as part of the detection monitoring system for the waste pile per Section 20415 of Title 27. At least one additional well is necessary at the point of compliance to comply with Section 20415 of Title 27.
35. Well MWC was installed as the background water quality monitoring well. Between October 2003 and November 2004, six independent sampling events have occurred. The data is insufficient to establish water quality protection standards per Title 27. However, the following table gives an initial representation of the water quality at Monitoring Well MWC.



Constituents of Concern	Lowest Detected Concentration	Highest Detected Concentration
Electrical Conductivity	184 micromhos/cm	256 micromhos/cm
Total Dissolved Solids	132 mg/l	210 mg/l
Arsenic	3.0 ug/l	6.7 ug/l
Aluminum	23 mg/l	35 mg/l
Cadmium	<1.0 ug/l	<1.0 ug/l
Chromium	17 ug/l	66 ug/l
Chloride	2.3 mg/l	5.1 mg/l
Copper	7 ug/l	48 ug/l
Lead	<3.0 ug/l	4.1 ug/l
Manganese	6 ug/l	76 ug/l
Iron	<.05 mg/l	70 mg/l
Sulfate	3.4 mg/l	6.8 mg/l
Nitrogen, Total Nitrate -N	<0.05 mg/l	<0.05 mg/l
Perchlorate	N/A	N/A

This order requires further sampling be completed and that water quality protection standards be established prior to discharge to the Surface Fill Unit.

### Underground Mine

36. There are no monitoring wells currently installed to collect data to establish a water quality protection standard for the underground mining operation. Groundwater samples collected in the vicinity of the Stringbean Decline were obtained from exploratory borings many years ago. Therefore, prior to discharge of mine waste to the underground workings (stopes), the Discharger must install a monitoring system and establish water quality protection standards as required by Title 27.
37. Groundwater samples were collected during the period from 1988 to 1992 from the six monitoring wells located along the mineralized zone near the Stringbean Decline (MDDH-36, MDDH-41,

MDDH-43, MDDH-45, MDDH-47, and MDDH-54). Arsenic concentrations range from 0.014 mg/l to 0.0185 mg/l. These results indicate that natural arsenic groundwater concentrations near the ore body exceed the current Maximum Contaminant Level for arsenic of 0.010 mg/l.

38. Groundwater seepage into the Stringbean Decline from vent shafts and other man-made openings that connect the weathered zone above the mine to the underground workings of the decline is estimated to be at around 1.9 gallons per minute (gpm).

### **POST-MINING GROUNDWATER QUALITY**

39. During mining activities, the groundwater in the underground workings will be controlled through pumping, as it is today in the Stringbean Decline. This activity will allow the wall rock and the ore zone to react with oxygen, forming oxides. This is typical of acid mine drainage reactions. However, the wall rock in this area contains carbonate minerals, which buffer the low pH generation. If groundwater is allowed to rise back up after mining ceases, the groundwater will come into contact with the oxidized wall rock and ore zone and will dissolve these oxides. This could result in an increase in salts and metals (such as sulfate and arsenic), which could degrade groundwater.
40. These WDRs do not allow the refilling of mine by groundwater because doing so will likely result in elevated levels of salts and metals in the groundwater. The Discharger has stated that groundwater flows are very low in the vicinity of the Stringbean Decline because of the massive nature of the surrounding greenstone bedrock. The Discharger has provided evidence that sustained groundwater yield in this area is below 200 gallons per day. Additional data is required to support this assertion. If the Discharger is unable to adequately dewater the mine to prevent groundwater impacts, then the Discharger must submit a proposal to amend the Basin Plan to de-designate local groundwater under State Water Resources Control Board (State Board) Resolution No. 88-63, the Sources of Drinking Water Policy.
41. State Board Resolution No. 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State") (hereafter Resolution No. 68-16) requires a regional board in regulating the discharge of waste to maintain high quality waters of the state (i.e., background water quality) until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than as described in plans and policies (e.g. violation of any water quality objective). The discharge is required to meet waste discharge requirements that will result in the best practicable treatment or control of the discharge necessary to assure that pollution or nuisance will not occur and highest water quality consistent with maximum benefit to the people will be maintained.
42. Although the Discharger has provided information as to the local economic benefit of the mine, the Regional Board finds that the Discharger has not demonstrated that it is to the maximum benefit to the people of the State of California to degrade groundwater, and therefore groundwater degradation is not allowed under this Order.

## **WATER QUALITY PROTECTION STANDARD**

43. The Discharger must establish water quality protection standards, which shall consist of the list of constituents of concern (under Title 27 section 20395), the concentration limits (under section 20400), and the Point of Compliance and all Monitoring Points (under section 20405). This Water Standard shall apply during the active life of the Units, the closure period, the post closure maintenance period, and during any compliance period (under section 20410). Furthermore, these values shall represent background water quality for both groundwater and surface water. Prior to any discharge into the Waste Rock Pile or the Group B waste pile (Surface Fill Unit), and prior to initiation of any discharge of mine waste to the underground mine workings, these values shall be approved by the Executive Officer.

## **CONTAINMENT OF MINING WASTE**

### **Waste Rock Pile**

44. The country rock will be placed onto an engineered liner that complies with Title 27. The design of this unit is equivalent to the prescriptive standard described in Chapter 7 of Title 27. The design of the waste pile consists of, from the top down:
- a. 12-inches of poorly graded gravel, or equivalent, with 4-inch schedule 80 perforated drainpipes wrapped in a single layer geo-fabric as a leachate collection and recovery system.
  - b. 12-inches of clay at a relative compaction of 90 percent, or equivalent, with a minimum hydraulic conductivity of  $1 \times 10^{-7}$  cm/sec.
  - c. 12-inches of poorly graded gravel, or equivalent, with 2-inch schedule 80 perforated drainpipes wrapped in a single layer geo-fabric as a leachate collection and recovery system.
  - d. An engineered compacted subgrade having all slopes rolled with a smooth drum compactor to eliminate soft spots and protruding rocks.

All leachate derived from the waste rock pile will be drained and captured in a lined detention basin. The liner system will consist of, from top down: a geomembrane liner; geosynthetic clay liner; nonwoven geotextile; and engineered compacted subgrade having all slopes rolled with a smooth drum compactor to eliminate soft spots and protruding rocks prior to installation of the nonwoven geotextile. Once captured, the water will be returned within 24 hours to the mill for use in the ore extraction process.

### **Group B Waste Pile (Surface Fill Unit)**

45. For containment of mine waste material smaller than a 325 sieve, the Discharger proposes to construct a dewatering plant to dewater the fine mill tailings prior to discharge to an engineered waste pile (Surface Fill Unit). The Surface Fill Unit will be designed and constructed in accordance with Title 27 Group B waste pile containment system.

The Unit will be located half mile east of the Stringbean Decline underground workings, as shown on Attachment 1. The design of the waste pile containment system proposed by the Discharger conservatively assumes the mill tailings would be classified as Group A mine waste and consists from the top down:

- a. A blanket leachate collection and removal system, designed constructed and operated in compliance with Title 27 Subsection 20340;
  - b. A geomembrane liner;
  - c. A geosynthetic clay liner;
  - d. A nonwoven geotextile; and
  - e. An engineered compacted subgrade having all slopes rolled with a smooth drum compactor to eliminate soft spots and protruding rocks prior to installation of the nonwoven geotextile.
46. The Discharger proposes a liner system which will be designed, constructed, and operated to prevent migration of wastes from the Unit to adjacent natural geologic materials, groundwater, or surface water during disposal operations, closure, and the postclosure maintenance period in accordance with the criteria set forth in Title 27 for a waste management unit.
47. Pursuant to Section 22490 of Title 27 the LCRS system is a blanket type design.
48. Section 13360(a)(1) of the California Water Code allows the Regional Board to specify the design, type of construction, and/or particular manner in which compliance must be met in waste discharge requirements or orders for the discharge of waste at solid waste disposal facilities.
49. Construction will proceed only after all applicable final design and construction quality assurance plans have been approved by the Executive Officer.

### **Underground Mine Waste Disposal**

50. For mining waste which does not pass through a 325 sieve, the Discharger proposes an engineered alternative to the prescriptive liner requirement for Group B waste containment found in Title 27. The Discharger proposes to encapsulate the material in 5% concrete either as a slurry type backfill

and place it in the underground workings as an engineered structural support in the stopes. The dimensions of each encapsulated block will be approximately 200' long, 9' in height and 4' to 10' wide. The actual size of each structural block will be dependent of the size of the mineralized zone. These blocks will be stacked on top of each other as a support column. A geonet drainage layer will be placed between the blocks to allow for drainage. Any standing water will be removed and returned to the mill as process water or discharged to land under separate WDRs. The addition of 5% concrete slurry to the waste will prevent any significant water flow through the waste and affords equivalent protection against water quality impairment to the prescriptive standard.

51. Section 20080(b) of Title 27 allows the Regional Board to consider the approval of an engineered alternative to the prescriptive standard. In order to approve an engineered alternative, in accordance with §20080(c)(1) and (2) the Discharger must demonstrate either (a) that the prescriptive design is unreasonably and unnecessarily burdensome and will cost substantially more than an alternative which will meet the criteria contained in §20080(b), or (b) that the prescriptive standard would be impractical and would not promote attainment of applicable performance standards. In accordance with §20080(b)(2) of Title 27, the Discharger must also demonstrate that the proposed engineered alternative(s) provides protection against water quality impairment equivalent to the prescriptive standard.
52. The Discharger has demonstrated that the encapsulation of the greater than 325 sieve mining waste and placement in underground workings as described in Finding 50 is consistent with the performance goals of a Group B mining waste unit, affords equivalent protection against water quality impairment, significantly reduces surface disturbances, improves mine safety and productivity and costs substantially less than the prescriptive standard. Therefore, the encapsulation of greater than 325 sieve mining waste meets the engineered alternative to the prescriptive standard. Construction or underground discharge of waste will proceed only after all applicable construction quality assurance plans have been approved by the Executive Officer.

### **CEQA AND OTHER CONSIDERATIONS**

53. The Amador County Board of Supervisors approved the Lincoln Mine project and filed a Notice of Determination for the project on 25 August 1993. In a subsequent action the Board of Supervisors adopted Resolution No. 98-351 and approved findings relative the the Conditional Use permit and the Final Subsequent Environmental Impact Report for the amended project on 15 September 1998 in accordance with the California Environmental Quality Act (Public Resources Code Section 21000 et seq.) and CEQA guidelines (14 CCR Section 15000 et seq.). The Regional Board considered the environmental impact report (EIR) and incorporated its mitigation measures into these waste discharge requirements. The following list identifies the significant impacts and mitigations regarding water quality:
  - a. The EIR states that any additional sediment load in the streams would be mitigated by implementing best management practices. This Order requires that the Discharger annually implement erosion control measures and seek coverage under an NPDES Stormwater Permit.

- b. Groundwater flow may be influenced by mining operations at the Stringbean Decline; therefore, the EIR requires that the Discharger obtain water supplies or potable water as appropriate to replace lost local spring flows or impacts to the quality or quantity of an existing domestic water supply source attributable, in the opinion of the Amador County Environmental Health Department, to the Lincoln Mine project.
- c. A domestic wastewater treatment facility is required to accommodate the employees and visitors to the mine. These WDRs do not address the issue of wastewater disposal but require that the Discharger demonstrate that it has received proper County and/or State permits for the disposal of domestic wastewater.

54. This Order incorporates and implements:

- a. Fourth Edition of the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins;
- b. The prescriptive standards and performance goals of California Code of Regulations, effective 18 July 1997, and subsequent revisions;
- c. State Board Resolution No. 68-16 – The Anti-Degradation Policy; and
- d. State Resolution No. 88-63 – The Sources of Drinking Water Policy.

55. Section 13267(b) of California Water Code provides that: “In conducting an investigation specified in subdivision (a), the Regional Board may require that any person who has discharged, discharges, or is suspected of discharging, or who proposed to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who had discharged, discharges, or is suspected of discharging, or who proposed to discharge waste outside of its region that could affect the quality of the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.”
56. The monitoring and reporting program required by this Order (Monitoring and Reporting Program No. R5-2005-0164, attached) is necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

### **PROCEDURAL REQUIREMENTS**

57. All local agencies with jurisdiction to regulate land use, solid waste disposal, air pollution, and to protect public health have approved the use of this site for the discharges of waste to land stated herein.
58. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.
59. The Regional Board notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge, and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
60. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
61. Any person affected by this action of the Regional Board may petition the State Water Resources Control Board to review the action in accordance with Sections 2050 through 2068, Title 23, California Code of Regulations. The petition must be received by the State Water Resources Control Board, Office of Chief Counsel, P.O. Box 100, Sacramento, California 95812, within 30 days of the date of issuance of this Order. Copies of the laws and regulations applicable to the filing of a petition are available on the Internet at [http://www.waterboards.ca.gov/water\\_laws/index.html](http://www.waterboards.ca.gov/water_laws/index.html) and will be provided on request.

**IT IS HEREBY ORDERED** pursuant to Sections 13263 and 13267 of the California Water Code, that USECC Gold Limited Liability Company, Sutter Gold Mining Company, Sutter Gold Mining Inc. U.S. Energy Corp, and the Property Owners (as identified in Finding No. 3), their agents, successors and assigns, in order to meet the provisions of Division 7 of the California Water Code and the regulations adopted thereunder, shall comply with the following:

#### **A. PROHIBITIONS**

1. The discharge of 'hazardous waste' or 'Group A' mining waste at this facility is prohibited. For the purposes of this Order, the terms 'hazardous waste', 'designated waste', and 'Group A' and 'Group B' mining waste are as defined in Division 2 of Title 27.
2. The discharge of solid waste or liquid waste to surface waters, surface water drainage courses, or groundwater is prohibited.

3. The discharge of wastes outside of a waste management unit or portions of a waste management unit specifically designed for their containment is prohibited except as otherwise permitted under additional Regional Board orders.
4. The accumulation of water at the base of the Stringbean Decline, beyond that which is needed to maintain safe pumping operations, is prohibited.
5. Construction of the Waste Rock Pile and the Surface Fill Unit, as well as encapsulation of mining waste, is prohibited until the Executive Officer has approved each applicable final design and construction quality assurance plans in writing.
6. The discharge of mine waste to the Waste Rock Pile, the Surface Fill Unit and the underground mine workings are all prohibited until reports documenting the following work have been submitted and the Executive Officer has approved each in writing:
  - a. Submittal of a workplan for a groundwater quality monitoring system;
  - b. Installation of an approved groundwater quality monitoring system which includes background monitoring wells;
  - c. Establishment of background groundwater quality through at least one year of monitoring (a minimum of eight samples is required to develop statistical values for inorganic COCs);
  - d. Submittal of a report proposing a Water Quality Protection Standard; and
  - e. Submittal of a plan to maintain the base of the mine free of accumulated water.
7. The discharge of mine waste to the Waste Rock Pile, the Surface Fill Unit and the underground mine workings are all prohibited until the Discharger establishes Financial Assurance funds for corrective action, unit closure, and post-closure maintenance, and the Executive Officer has approved these funds in writing.

## **B. DISCHARGE SPECIFICATIONS**

### **General Specifications**

1. Wastes shall only be discharged into, and shall be confined to, the waste management units (WMUs) specifically designed for their containment.
2. Prior to the discharge of waste to a WMU, all wells within 500 feet of the unit shall have sanitary seals or shall be properly abandoned. A record of the sealing and/or abandonment of such wells shall be sent to the Regional Board and to the State Department of Water Resources.

### **Protection From Storm Events**

3. All waste management units shall be designed, constructed and operated to prevent inundation or washout due to flooding events with a 100-year return period.



4. All waste management units' precipitation and drainage control systems shall be designed, constructed and maintained to accommodate the anticipated volume of precipitation and peak flows from surface runoff under 25-year, 24-hour precipitation conditions.
5. Annually, prior to the anticipated rainy season, any necessary erosion control measures shall be implemented, and any necessary construction, maintenance, or repairs of precipitation and drainage control facilities shall be completed to prevent erosion or flooding of the site.
6. To comply with federal regulations for stormwater discharges promulgated by the U.S. EPA, the Discharger shall seek coverage under the State Board's Water Quality Order No. 97-03-DWQ, and shall conduct the monitoring and reporting as required therein.

#### **Waste Rock Pile**

7. The design of the waste pile shall consist of, from the top down:
  - a. 12-inches of poorly graded gravel, or equivalent, with 4-inch schedule 80 perforated drainpipes wrapped in a single layer geo-fabric as a leachate collection and recovery system.
  - b. 12-inches of clay at a relative compaction of 90 percent, or equivalent, with a minimum hydraulic conductivity of  $1 \times 10^{-7}$  cm/sec.
  - c. 12-inches of poorly graded gravel, or equivalent, with 2-inch schedule 80 perforated drainpipes wrapped in a single layer geo-fabric as a leachate collection and recovery system.
  - d. An engineered compacted subgrade having all slopes rolled with a smooth drum compactor to eliminate soft spots and protruding rocks.
8. The Waste Rock Pile design shall include an unsaturated zone monitoring system capable of measuring both saturated and unsaturated flows that may occur as a result of a release from the waste management unit.
9. All leachate and storm water derived from the waste rock pile will be drained and captured in a lined detention basin. The liner system will consist from top down: a geomembrane liner; geosynthetic clay liner; nonwoven geotextile; and engineered compacted subgrade having all slopes rolled with a smooth drum compactor to eliminate soft spots and protruding rocks prior to installation of the nonwoven geotextile. Once captured, the water will be returned within 24 hours to the mill for use in the ore extraction process.

10. Materials used to construct liners shall have appropriate physical and chemical properties to ensure containment of discharged wastes over the operating life, closure, and post-closure maintenance period of the Waste Rock Pile.
11. Materials used to construct leachate collection and removal systems (LCRSs) shall have appropriate physical and chemical properties to ensure the required transmission of leachate over the life of the Waste Rock Pile and the post-closure maintenance period.
12. LCRSs shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by the Waste Rock Pile and to prevent the buildup of hydraulic head on the underlying liner at any time. The depth of the fluid in any LCRS sump shall be kept at the minimum needed for safe pump operation.
13. Any direct-line discharge to the Waste Rock Pile shall have fail-safe equipment or operating procedures to prevent overfilling.
14. The Waste Rock Pile shall be designed, constructed and maintained to prevent scouring and/or erosion of the liners and other containment
15. Leachate generation by the Waste Rock Pile to the primary LCRS shall not exceed design requirements. If leachate generation exceeds this value, then the Discharger shall immediately cease the discharge of waste and shall notify the Regional Board in writing within **seven days**. Notification shall include a timetable for remedial action to repair the waste management unit or other action necessary to reduce leachate production.
16. If leachate is detected in the unsaturated zone monitoring system of the Waste Rock Pile (indicating a leak in the containment system) the Discharger shall:
  - a. Immediately cease discharge of waste;
  - b. Report to the Regional Board the indication of a leak in the containment system within **72 hours**;
  - c. Submit written notification of the release to the RWQCB within seven days. The notification should include a time schedule to investigate the release and implement corrective actions including any repairs to the containment system; and
  - d. Discharge of wastes to the Waste Rock Pile will not resume until the Regional Board has determined that repairs to the containment system is complete and there is no further threat to water quality.
17. Leachate generation by a waste containment unit to the LCRS shall not exceed 85% of the design capacity of (a) the LCRS, or (b) the sump pump. If leachate generation exceeds this value and/or if the depth of the fluid in an LCRS exceeds the minimum needed for safe pump operation, then the Discharger shall immediately cease the discharge of waste, excluding leachate, to the waste management unit and shall notify the Regional Board in writing within

**seven days.** Notification shall include a timetable for a remedial action to repair the containment structures or other action necessary to reduce leachate production.

### **Waste Rock Pile Closure**

18. The closure of the Waste Rock Pile shall be under the direct supervision of a California registered civil engineer or certified engineering geologist.

### **Group B Waste Pile (Surface Fill Unit)**

19. The Surface Fill Unit shall consist of, from the top down:
- a. A blanket leachate collection and removal system, designed constructed and operated in compliance with Title 27 Subsection 20340;
  - b. A geomembrane liner;
  - c. A geosynthetic clay liner;
  - d. A nonwoven geotextile; and
  - e. An engineered compacted subgrade having all slopes rolled with a smooth drum compactor to eliminate soft spots and protruding rocks prior to installation of the nonwoven geotextile.
20. The Surface Fill Unit design shall include an unsaturated zone monitoring system capable of measuring both saturated and unsaturated flows that may occur as a result of a release from the waste management unit.
21. Materials used to construct liners shall have appropriate physical and chemical properties to ensure containment of discharged wastes over the operating life, closure, and post-closure maintenance period of the Surface Fill Unit.
22. Materials used to construct leachate collection and removal systems (LCRSs) shall have appropriate physical and chemical properties to ensure the required transmission of leachate over the life of the Surface Fill Unit and the post-closure maintenance period.
23. LCRSs shall be designed, constructed, and maintained to collect twice the anticipated daily volume of leachate generated by the Surface Fill Unit and to prevent the buildup of hydraulic head on the underlying liner at any time. The depth of the fluid in any LCRS sump shall be kept at the minimum needed for safe pump operation.
24. Any direct-line discharge to the Surface Fill Unit shall have fail-safe equipment or operating procedures to prevent overfilling.

25. The Surface Fill Unit shall be designed, constructed and maintained to prevent scouring and/or erosion of the liners and other containment
26. Leachate generation by the Surface Fill Unit to the primary LCRS shall not exceed design requirements. If leachate generation exceeds this value, then the Discharger shall immediately cease the discharge of waste and shall notify the Regional Board in writing within seven days. Notification shall include a timetable for remedial action to repair the waste management unit or other action necessary to reduce leachate production.
27. If leachate is detected in the unsaturated zone monitoring system of the Surface Fill Unit (indicating a leak in the containment system) the Discharger shall:
  - a. Immediately cease discharge of waste, excluding leachate to the Surface Fill Unit until the leaks can be found and repaired,
  - b. Report to the Regional Board the indication of a leak in the containment system within 72 hours,
  - c. Submit written notification of the release to the RWQCB within seven days. The notification should include a time schedule to investigate the release and implement corrective actions including any repairs to the containment system, and
  - d. Discharge of wastes to the Surface Fill Unit will not resume until the Regional Board has determined that repairs to the containment system is complete and there is no further threat to water quality.
28. Leachate generation by a waste containment unit LCRS shall not exceed 85% of the design capacity of (a) the LCRS, or (b) the sump pump. If leachate generation exceeds this value and/or if the depth of the fluid in an LCRS exceeds the minimum needed for safe pump operation, then the Discharger shall immediately cease the discharge of waste, excluding leachate, to the waste management unit and shall notify the Regional Board in writing within **seven days**. Notification shall include a timetable for a remedial action to repair the containment structures or other action necessary to reduce leachate production.

#### **Group B Waste Pile (Surface Fill Unit) Closure**

29. The closure of the Surface Fill Unit shall be under the direct supervision of a California registered civil engineer or certified engineering geologist.

#### **Underground Mine Waste Disposal**

30. Mining waste larger than 325 sieve shall be mixed with 5% Portland cement as a binder and discharged as a slurry into the mine workings to form blocks to be used as engineered structural supports in the stopes. Upon written approval of the Executive Officer, other binders may be used that provide equivalent or better characteristics to protect water quality.

31. A geonet drainage layer shall be placed between the blocks to drain excess liquid. This excess liquid will drain to engineered sump(s).
32. All sumps shall be drained or pumped to minimize standing water excepting that which is necessary for safe pump operation. At a maximum, the hydraulic depth of standing water at the bottom Stringbean Decline shall not be greater than 12 feet vertically as measured at bottom of the incline.
33. Materials used to construct the drainage layer shall have appropriate physical and chemical properties to ensure the transmission of excess liquid from the waste (slurry blocks) after placement.
34. During mining operations, if the Discharger encounters any intersected fracture that produces groundwater flows greater than 1.9 gpm (or lower flows if needed to comply with Prohibition A.4), the Discharger must control or stop such groundwater inflows by grouting, or other means prescribed by an engineering geologist or civil engineer and allowed by the plan required in Prohibition 6.e.

## C. RECEIVING WATER LIMITATIONS

### Water Quality Protection Standards

1. The concentrations of Constituents of Concern in waters passing through the Points of Compliance shall not exceed the Concentration Limits established pursuant to Monitoring and Reporting Program No. R5-2005-0164, which is attached to and made part of this Order.

## D. GROUNDWATER LIMITATIONS

1. Neither the discharge of waste to the Waste Rock Pile, the Surface Fill Unit, the Underground Waste Management Units, nor the act of underground mining shall cause groundwater to be degraded.

## E. FINANCIAL ASSURANCE

1. The Discharger shall demonstrate *financial responsibility for closure and post-closure maintenance* for the underground mine, the Waste Rock Pile, the mill, and the Surface Fill Unit and shall submit a report of financial assurances by **April 30th each year** for Executive Officer review and approval. The assurances of financial responsibility shall provide that funds for closure and post-closure maintenance shall be available to the Regional Board upon the issuance of any order under California Water Code, Division 7, Chapter 5. The Discharger shall adjust the cost annually to account for inflation and any changes in facility design, construction, or operation. The financial assurance fund for closure and post-closure maintenance shall be established **prior to discharging waste to the** Waste Rock Pile, the Surface Fill Unit and/or underground mine workings

USECC GOLD LIMITED LIABILITY COMPANY, SUTTER GOLD MINING COMPANY.  
SUTTER GOLD MINING INC., U.S. ENERGY CORP, PROPERTY OWNERS  
LINCOLN MINE PROJECT  
AMADOR COUNTY

2. Prior to discharge of mine waste and thereafter by **30 April of each year**, the Discharger shall submit plans with detailed cost estimates and a demonstration of assurances of financial responsibility for initiating and completing *corrective action for all known or reasonably foreseeable releases* for the underground mine, the Waste Rock Pile, the mill, and the Surface Fill Unit. The Discharger shall provide the assurances of financial responsibility as required by Title 27, Division 2, Subdivision 1, Chapter 6. The assurances of financial responsibility shall provide that funds for corrective action shall be available to the Regional Board upon the issuance of any order under California Water Code, Division 7, Chapter 5. The Discharger shall adjust the cost annually to account for inflation and any changes in facility design, construction, or operation. The financial assurance fund for corrective action shall be established **prior to discharging waste to the** Waste Rock Pile, the Surface Fill Unit and/or underground mine workings

#### E. PROVISIONS

1. The Discharger shall comply with the Standard Provisions and Reporting Requirements, dated September 2003, which are hereby incorporated into this Order. The Standard Provisions and Reporting Requirements contain important provisions and requirements with which the Discharger must comply. A violation of any of the Standard Provisions and Reporting Requirements is a violation of these waste discharge requirements.
2. The Discharger shall comply with Monitoring and Reporting Program No. R5-2005-0164, which is attached to and made part of this Order. This compliance includes, but is not limited to, maintenance of waste containment facilities and precipitation and drainage controls and the monitoring of groundwater, the unsaturated zone, and surface waters throughout the active life of the waste management units and the post-closure maintenance period. A violation of Monitoring and Reporting Program No. R5-2005-0164 is a violation of these waste discharge requirements.
3. At least **ninety days prior to construction of the mill facilities**, the Discharger must submit copies of appropriate County or State permits allowing the discharge of domestic wastewater from the wastewater treatment facilities necessary to accommodate the additional temporary construction and operations employees.
4. By **1 June 2006**, the Discharger shall submit a report of waste discharge to update WDRs Order No. 99-035. The Discharger shall contact Regional Board staff at least 90 days prior to this date to determine the information that must be submitted in the report of waste discharge.
5. The Discharger shall complete the following tasks by the required dates:

Unit	Task	Compliance Date
Waste Rock Pile	The Discharger shall submit a	Prior to discharging

Unit	Task	Compliance Date
	groundwater monitoring system workplan that complies with Subchapter 3 of Title 27 and contains the information listed in the first section of Attachment 2. Upon concurrence, the system shall be installed.	waste to the Waste Rock Pile.
Waste Rock Pile	The Discharger shall submit a groundwater system monitoring report that documents that monitoring wells were installed per the approved workplan and contains the information listed in the second section of Attachment 2.	Prior to discharging waste to the Waste Rock Pile.
Waste Rock Pile	The Discharger shall submit unsaturated zone monitoring system workplan that complies with Subchapter 3 of Title 27 and after concurrence, shall install the monitoring system.	Prior to discharging waste to the Waste Rock Pile.
Waste Rock Pile	The Discharger shall submit a report characterizing background water quality conditions and proposed water quality protection standards per Section 20390 of Title 27. This may be included with the Stringbean Alley groundwater study.	Prior to discharging waste to the Waste Rock Pile.
Waste Rock Pile	The Discharger shall submit Final Design that meets requirements of Chapter 3, Subchapter 2, Article 4 of Title 27 and Construction Quality Assurance plans for the	120 days prior to construction of the Waste Rock Pile.

Unit	Task	Compliance Date
	construction of the Waste Rock Pile per Section 20323 of Title 27.	
Waste Rock Pile	The Discharger shall submit a Construction Quality Assurance Report for the Waste Rock Pile per Section 20324(d) of Title 27.	60 days after completion of construction of the containment system or each portion thereof.
Waste Rock Pile	The Discharger shall submit a map of all springs and seeps that complies with Section 21750(g)(5) of Title 27. The map should be accompanied by tabular data indicating the flow and the mineral quality of the water from each spring.	Prior to discharging waste to the Waste Rock Pile.
Waste Rock Pile	The Discharger shall submit a report proposing surface water monitoring system that complies with Subchapter 3 of Title 27.	Prior to discharging waste to the Waste Rock Pile
Waste Rock Pile	The discharger shall have all best management practices in place and operational to comply with Section 20365 of Title 27.	15 November 2006
Surface Fill Unit	The Discharger shall submit a groundwater system monitoring report that documents that monitoring wells were installed per the approved workplan and contains the information listed in the second section of Attachment 2.	Prior to discharging waste to the Surface Fill Unit.



Unit	Task	Compliance Date
Surface Fill Unit	The Discharger shall submit unsaturated zone monitoring system report that complies with Subchapter 3 of Title 27 and after concurrence shall install the monitoring system.	Prior to discharging waste to the Surface Fill Unit
Surface Fill Unit	The Discharger shall submit a report characterizing background water quality conditions and proposed water quality protection standards per Section 20390 of Title 27.	Prior to discharging waste to the Surface Fill Unit
Surface Fill Unit	The Discharger shall submit a Final Design that meets requirements of Chapter 3, Subchapter 2, Article 4 of Title 27 and Construction Quality Assurance plans for the construction of the Surface Fill Unit per Section 20323 of Title 27.	120 days prior to construction of the Surface Fill Unit
Surface Fill Unit	The Discharger shall submit a Construction Quality Assurance Report for the Surface Fill Unit per Section 20324(d) of Title 27.	60 days after completion of construction of the containment system or each portion thereof.
Surface Fill Unit	The Discharger shall submit an operations, maintenance, and spill response plan for the pipeline that conveys waste from the mill to the Surface Fill Unit.	Prior to discharging waste to the Surface Fill Unit

Unit	Task	Compliance Date
Surface Fill Unit	The Discharger shall submit an emergency response plan for the pipeline which addresses a catastrophic failure of all components related to the transfer of the –325 mesh fill material.	Prior to discharging waste to the Surface Fill Unit
Surface Fill Unit	The Discharger shall submit a map of all springs and seeps that complies with Section 21750(g)(5) of Title 27. The map should be accompanied by tabular data indicating the flow and the mineral quality of the water from each spring.	Prior to discharging waste to the Surface Fill Unit
Surface Fill Unit	The Discharger shall submit an operations plan for the Surface Fill Unit that complies with Section 21760(b) of Title 27.	Prior to discharging waste to the Surface Fill Unit
Surface Water	The Discharger shall install submit a report proposing a surface water monitoring system that complies with Subchapter 3 of Title 27.	Prior to discharging waste to the Surface Fill Unit
Surface Water	The discharger shall have all best management practices in place and operational to comply with Section 20365 of Title 27.	15 November 2006
Stringbean Decline Underground Workings	The Discharger shall submit a groundwater monitoring system workplan that complies with Subchapter 3 of Title 27 and contains the information listed in	Prior to discharge of mine waste to the underground workings

Unit	Task	Compliance Date
	the first section of Attachment 2. Upon concurrence, the system shall be installed.	
Stringbean Decline Underground Workings	The Discharger shall submit a groundwater system monitoring report that documents that monitoring wells were installed per the approved workplan and contains the information listed in the second section of Attachment 2.	Prior to discharging waste to the underground workings
Stringbean Decline Underground Workings	The Discharger shall submit a plan for maintaining the entire mine free of accumulated water during mining operations and the duration of post closure.	Prior to discharge of mine waste to the underground workings
Underground mine waste disposal	The Discharger shall submit a report, with supporting data, before any change in binding agent for disposal of waste greater than 325 sieve mesh. The binder may not be used until the Executive Officer provides concurrence.	Prior to use of new Binder

6. The Discharger shall maintain legible records of the volume and type of waste discharged to the Waste Rock Pile, the Surface Fill Unit and the manner and location of the discharge. Such records shall be maintained at the facility until the beginning of the post-closure maintenance period. These records shall be available for review by representatives of the Regional Board and of the State Water Resources Control Board, copies of these records shall be sent to the Regional Board.
7. The Discharger shall provide proof to the Regional Board **within sixty days after completing final closure** that the deed to the Surface Fill Unit property, or some other instrument that is normally examined during title search, has been modified to include, in perpetuity, a notation to any potential purchaser of the property stating that:

- a. The parcel has been used for disposal of Group B solid mine wastes;
  - b. Land use options for the parcel are restricted in accordance with the post-closure land uses set forth in the post-closure plan; and
  - c. In the event that the Discharger defaults on carrying out either the post-closure maintenance plan or any corrective action needed to address a release, then the responsibility for carrying out such work falls to the property owner.
7. In the event of any change in control or ownership of the facility or land application areas, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Regional Board, and a statement. The statement shall comply with the signatory paragraph of the Standard Provisions and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved by the Executive.
8. For the purpose of resolving any disputes arising from or related to the California Water Code, any regulations promulgated thereunder, these WDRs, or any other orders governing this site, the Discharger, its parents and subsidiaries, and their respective past, present, and future officers, directors, employees, agents, shareholders, predecessors, successors, assigns, and affiliated entities, consent to jurisdiction of the Courts of the State of California.
9. The Regional Board will review this Order periodically and may revise requirements when necessary.
- I, Thomas R. Pinkos, Executive Officer, do hereby certify the foregoing is a full, true and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region on 21 October 2005.

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THOMAS R. PINKOS, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2005-0164

FOR  
USECC GOLD LIMITED LIABILITY COMPANY  
SUTTER GOLD MINING COMPANY  
SUTTER GOLD MINING INC.  
US ENERGY CORP, PROPERTY OWNERS  
FOR  
LINCOLN MINE PROJECT  
CONSTRUCTION OF WASTE PILES AND EXPANDED MINING OPERATIONS  
AMADOR COUNTY

Pursuant to Section 13267 of the California Water Code, the Discharger shall comply with this Monitoring and Reporting Program, and with the companion Standard Provisions and Reporting Requirements, as ordered by Waste Discharge Requirements Order No. R5-2005-0164. Failure to comply with this Program, or with the Standard Provisions and Reporting Requirements dated September 2003, constitutes noncompliance with the WDRs and with the Water Code, which can result in the imposition of civil monetary liability. The Discharger shall not implement any changes to this MRP unless a revised MRP is issued by the Executive Officer.

**A. REPORTING**

The Discharger shall report monitoring data and information as required in this Monitoring and Reporting Program and as required in the Standard Provisions and Reporting Requirements. Reports which do not comply with the required format will be **REJECTED** and the Discharger shall be deemed to be in noncompliance with the WDRs. In reporting the monitoring data required by this program, the Discharger shall arrange the data in tabular form so that the date, the constituents, the concentrations, and the units are readily discernible. The data shall be summarized in such a manner so as to illustrate clearly the compliance with waste discharge requirements or the lack thereof. Historical and current monitoring data shall be graphed at least once annually. Graphs for the same constituent shall be plotted at the same scale to facilitate visual comparison of monitoring data. A short discussion of the monitoring results, including notations of any water quality violations shall precede the tabular summaries. Data shall also be submitted in a digital format acceptable to the Executive Officer.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those which cannot be quantified and/or specifically identified. Field and laboratory tests shall be reported in the quarterly monitoring reports. The results of any monitoring done more frequently than required at the locations specified herein shall be reported to the Board.

**B. REQUIRED MONITORING REPORTS AND SUBMITTAL DATES**

**1. Quarterly Groundwater, Vadose Zone, and Leachate Monitoring Reports**

All Quarterly monitoring reports shall include all water quality data and observation collected during the reporting period and submitted per the **Reporting Due Dates** in Section B.6. of this Monitoring and Reporting Program. At a minimum the sampling and data collection required in Section D of this

Monitoring and Reporting Program, as well as that required in the Standard Provisions and Reporting Requirements (2003) and the Waste Discharge Requirements shall be reported.

## **2. Annual Monitoring Summary Report**

The Discharger shall submit an Annual Monitoring Summary Report to the Board covering the previous monitoring year. The annual report shall contain the information specified in Standard Provisions and Reporting Requirements (2003), Section VIII.B. *“Reports to be Filed with the Board.”*

## **3. Facility Monitoring Report**

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess damage to the drainage control system, groundwater monitoring equipment (including wells, etc.), and shall include the Standard Observations contained in Section XII.S of the Standard Provisions and Reporting Requirements (2003).

## **4. Response to a Release**

If the Discharger determines that there is significant statistical evidence of a release (i.e. the initial statistical comparison or non-statistical comparison indicates, for any Constituent of Concern or Monitoring Parameter, that a release is tentatively identified), the Discharger shall **immediately** notify the Board verbally as to the Monitoring Point(s) and constituent(s) or parameter(s) involved, shall provide written notification by certified mail within **seven days** of such determination and shall implement the Response to Release section of the Standard Provisions and Reporting Requirements (2003).

## **5. Water Quality Protection Standard Report**

Any proposed changes in a statistical method or concentration limits for a constituent of concern or monitoring parameter a Water Quality Protection Standard Report shall be submitted and include the information required in Section C.1 of this Monitoring Reporting Program. Any changes to Water Quality Protection Standards shall be approved by the Executive Officer in a Revised Monitoring and Reporting Program.

## **6. Submittal Dates**

<b>Reporting Type</b>	<b>Sampling Frequency and Data Reported</b>	<b>Reporting Period</b>	<b>Report Date Due</b>
Quarterly	Daily, Weekly, Monthly and Quarterly	1 January – 31 March 1 April – 30 June 1 July – 30 September 1 October – 31 December	<b>30 April</b> <b>31 July</b> <b>31 October</b> <b>31 January</b>

<b>Annual Monitoring Summary Report</b>	<b>31 January</b>
<b>Facility Monitoring Report</b>	<b>15 November</b>
<b>Response to a Release</b>	<b>as necessary</b>
<b>Water Quality Protection Standard Report</b>	<b>as necessary</b>

### **C. WATER QUALITY PROTECTION STANDARD AND COMPLIANCE PERIOD**

#### **1. Water Quality Protection Standard Report**

For Surface Fill Unit and Stringbean Decline, the Water Quality Protection Standard shall consist of all constituents of concern, the concentration limit for each constituent of concern, the point of compliance, and all water quality monitoring points.

The Water Quality Protection Standard for naturally occurring waste constituents consists of the constituents of concern, the concentration limits, and the point of compliance and all monitoring points. The Executive Officer shall review and approve the Water Quality Protection Standard, or any modification thereto, for each monitored medium.

The report shall:

- a. Identify **all distinct bodies of surface and groundwater** that could be affected in the event of a release from a Unit or portion of a Unit. This list shall include at least the uppermost aquifer and any permanent or ephemeral zones of perched groundwater underlying the facility.
- b. Include a map showing the monitoring points and background monitoring points for the surface water monitoring program, groundwater monitoring program, and the unsaturated zone monitoring program. The map shall include the point of compliance in accordance with §20405 of Title 27.
- c. Evaluate the perennial direction(s) of groundwater movement within the uppermost groundwater zone(s).

If subsequent sampling of the background monitoring point(s) indicates significant water quality changes due to either seasonal fluctuations or other reasons unrelated to waste management activities at the site, the Discharger may request modification of the Water Quality Protection Standard.

## **2. Constituents of Concern**

The constituents of concern include all the waste constituents, their reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the Unit. The constituents of concern for all Units at the facility are those listed in Tables 1 through 4 for the specified monitored medium.

### **Monitoring Parameters**

Monitoring parameters are constituents of concern that are the waste constituents, reaction products, hazardous constituents, and physical parameters that provide a reliable indication of a release from a Unit. The monitoring parameters for all Units are those listed in Tables 1 through 5 for the specified monitored medium.

## **3. Concentration Limits**

For a naturally occurring constituent of concern, the concentration limit for each constituent of concern shall be determined as follows:

- a. By calculation in accordance with a statistical method pursuant to §20415 of Title 27; or
- b. By an alternate statistical method acceptable to the Executive Officer in accordance with §20415 of Title 27.

## **4. Point of Compliance**

The point of compliance for the water standard at each Unit is a vertical surface located at the hydraulically downgradient limit of the Unit that extends through the uppermost aquifer underlying the Unit.

## **D. MONITORING**

The Discharger shall comply with the monitoring program provisions of Title 27 for groundwater, surface water, and the unsaturated zone, in accordance with Monitoring Specifications in Standard Provisions and Reporting Requirements (2003). Detection monitoring for a new facility or a new Unit shall be installed, operational, and one year of monitoring data collected **prior to** the discharge of wastes. A minimum of 8 samples should be used to develop background concentrations for COCs. All monitoring shall be conducted in accordance with a Sample Collection and Analysis Plan, which includes quality assurance/quality control standards, that is acceptable to the Executive Officer.



All point of compliance monitoring wells established for the detection monitoring program shall constitute the monitoring points for the groundwater Water Quality Protection Standard. All detection monitoring program groundwater monitoring wells, unsaturated zone monitoring devices, leachate, and surface water monitoring points shall be sampled and analyzed for monitoring parameters and constituents of concern as indicated and listed in Tables 2 and 3.

Method detection limits and practical quantitation limits shall be reported. All peaks shall be reported, including those which cannot be quantified and/or specifically identified. Specific metals shall be analyzed in accordance with the methods listed in Table 4.

The Discharger may, with the approval of the Executive Officer, use alternative analytical test methods, including new USEPA approved methods, provided the methods have method detection limits equal to or lower than the analytical methods specified in this Monitoring and Reporting Program.

## 1. Waste Discharge Monitoring

The Discharger shall monitor all wastes discharged to the Surface Fill Unit on a monthly basis and report the results in the quarterly Detection Monitoring Reports:

Table 1 - Waste Discharge Monitoring		
<u>Parameters</u>	<u>Units</u>	<u>Frequency</u>
Quantity Discharged	tons	Monthly
Remaining Capacity	acre-feet	Monthly
Minimum Freeboard	Ft. & Tenths	Monthly

## 2. Groundwater

The Discharger shall operate and maintain a groundwater monitoring system that complies with the applicable provisions of §20415 of Title 27 in accordance with a Monitoring Program approved by the Executive Officer. The Discharger shall collect, preserve, and transport groundwater samples in accordance with the approved Sample Collection and Analysis Plan.

The Discharger shall determine the groundwater flow rate and direction in the uppermost aquifer and in any zones of perched water and in any additional zone of saturation monitored pursuant to this Monitoring and Reporting Program, and report the results semiannually, including the times of highest and lowest elevations of the water levels in the wells.

Hydrographs of each well shall be submitted showing the elevation of groundwater with respect to the elevations of the top and bottom of the screened interval and the elevation of the pump intake. Hydrographs of each well shall be prepared quarterly and submitted annually.

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LINCOLN MINE PROJECT  
AMADOR COUNTY

Groundwater samples shall be collected from the point-of-compliance wells, background wells, and any additional wells added as part of the approved groundwater monitoring system. Samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table 2.

The monitoring parameters shall also be evaluated each reporting period with regards to the cation/anion balance, and the results shall be graphically presented using a Piper graph, a Stiff diagram, or a Schueller plot.

<b>Table 2 - Groundwater Monitoring</b>		
<u>Parameters</u>	<u>Units</u>	<u>Frequency</u>
<u>Field Parameter</u>		
Groundwater Elevation	Ft., & hundredths, MSL	Quarterly
Temperature	°C	Quarterly
Specific Conductance	µmhos/cm	Quarterly
pH	pH number	Quarterly
<u>Monitoring Parameters</u>		
Total Dissolved Solids	mg/L	Quarterly
Total Alkalinity	mg/L	Quarterly
Total Hardness	mg/L	Quarterly
Bicarbonate	µg/L	Quarterly
Chloride	mg/L	Quarterly
Arsenic	mg/L	Quarterly
Aluminum	mg/L	Quarterly
Barium	mg/L	Quarterly
Cadmium	mg/L	Quarterly
Chromium	mg/L	Quarterly
Copper	mg/L	Quarterly
Lead	mg/L	Quarterly
Manganese	mg/L	Quarterly
Mercury	mg/L	Quarterly
Nickel	mg/L	Quarterly
Vanadium	mg/L	Quarterly
Zinc	mg/L	Quarterly
Selenium	mg/L	Quarterly
Thallium	mg/L	Quarterly
Sulfate	mg/L	Quarterly
Nitrate - Nitrogen	mg/L	Quarterly
Magnesium	mg/L	Quarterly
Calcium	mg/L	Quarterly
Sodium	mg/L	Quarterly
Perchlorate	mg/L	Quarterly

### **3. Unsaturated Zone Monitoring**

The Discharger shall operate and maintain an unsaturated zone detection monitoring system that complies with the applicable provisions of §20415 of Title 27 in accordance with a monitoring plan approved by the Executive Officer. The Discharger shall collect, preserve, and transport samples in accordance with the quality assurance/quality control standards contained in the approved Sample Collection and Analysis Plan.

Unsaturated zone samples shall be collected from the monitoring devices and background monitoring devices of the approved unsaturated zone monitoring system. The collected samples shall be analyzed for the listed constituents in accordance with the methods and frequency specified in Table 3. All monitoring parameters shall be graphed so as to show historical trends at each monitoring point.

The lysimeters shall be checked monthly for liquid and monitoring shall also include the total volume of liquid removed from the system. Unsaturated zone monitoring reports shall be included with the corresponding semiannual groundwater monitoring and shall include an evaluation of potential impacts of the facility on the unsaturated zone and compliance with the Water Quality Protection Standard.

### **4. LCRS Monitoring**

The LCRS sump shall be inspected quarterly for leachate. Upon detection of leachate in a previously dry LCRS, the Discharger shall immediately collect a grab sample of the leachate and continue to collect grab samples of the leachate at the frequency listed in Table 3. The leachate samples shall be analyzed for the listed constituents in accordance with the methods specified in Table 3.

All LCRSs shall be tested annually to demonstrate operation in conformance with waste discharge requirements. The results of these tests shall be reported to the Board and shall include comparison with earlier tests made under comparable conditions.

### **5. Underground Workings – Stope Block Drain Sumps**

The Stope Block Drain Sumps and mine drains shall be inspected daily for leachate. When a stope block is being placed, a grab sample shall be taken at the beginning of the setting-up process and at the end and analyzed for monitoring parameters listed on Table 3. Otherwise, samples shall be collected in the underground mine drains and sumps and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table 3.

## **6. Surface Water Monitoring**

The Discharger shall install and operate a surface water detection monitoring system where appropriate that complies with the applicable provisions of §20415 of Title 27 and has been approved by the Executive Officer.

For all monitoring points and background monitoring points assigned to surface water detection monitoring, samples shall be collected and analyzed for the monitoring parameters in accordance with the methods and frequency specified in Table 3. All monitoring parameters shall be graphed so as to show historical trends at each sample location.

## **7. Facility Monitoring**

### **a. Facility Inspection**

Annually, prior to the anticipated rainy season, but no later than **30 September**, the Discharger shall conduct an inspection of the facility. The inspection shall assess damage to the drainage control system, groundwater monitoring equipment (including wells, etc.), and shall include the Standard Observations contained in section F.4.f. of Standard Provisions and Reporting Requirements. Any necessary construction, maintenance, or repairs shall be completed by **31 October**. By **15 November** of each year, the Discharger shall submit an annual report describing the results of the inspection and the repair measures implemented, including photographs of the problem and the repairs.

### **b. Storm Events**

The Discharger shall inspect all precipitation, diversion, and drainage facilities for damage **within 7 days** following *major storm events*. Necessary repairs shall be completed **within 30 days** of the inspection. The Discharger shall report any damage and subsequent repairs within 45 days of completion of the repairs, including photographs of the problem and the repairs.

The Discharger shall implement the above monitoring program on the effective date of this Order. The transmittal letter accompanying monitoring reports submitted under this Order shall, as required under the Standard Provisions (*Provision 5, General Requirements, REPORTING REQUIREMENTS*), contain a statement by the discharger, or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate and complete.

Ordered by: \_\_\_\_\_  
THOMAS R. PINKOS, Executive Officer

\_\_\_\_\_  
21 October 2005

Date

USECC GOLD LIMITED LIABILITY COMPANY, SUTTER GOLD MINING COMPANY, SUTTER GOLD MINING CO., U.S. ENERGY CORP., AND PROPERTY OWNERS  
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<b>Table 3- Leachate and Unsaturated Zone Monitoring</b>		
<u>Parameters</u>	<u>Units</u>	<u>Frequency</u>
<u>Field Parameter</u>		
Flow Rate	gallons/month	Quarterly
Temperature	°C	Quarterly
Specific Conductance	µmhos/cm	Quarterly
pH	pH number	Quarterly
<u>Monitoring Parameters</u>		
Total Dissolved Solids	mg/L	Quarterly
Total Alkalinity	mg/L	Quarterly
Total Hardness	mg/L	Quarterly
Bicarbonate	µg/L	Quarterly
Chloride	mg/L	Quarterly
Arsenic*	mg/L	Quarterly
Aluminum	mg/L	Quarterly
Barium*	mg/L	Quarterly
Cadmium*	mg/L	Quarterly
Chromium*	mg/L	Quarterly
Copper*	mg/L	Quarterly
Lead*	mg/L	Quarterly
Manganese	mg/L	Quarterly
Mercury*	mg/L	Quarterly
Nickel*	mg/L	Quarterly
Vanadium*	mg/L	Quarterly
Zinc*	mg/L	Quarterly
Selenium*	mg/L	Quarterly
Thallium*	mg/L	Quarterly
Sulfate	mg/L	Quarterly
Nitrate – Nitrogen	mg/L	Quarterly
Magnesium	mg/L	Quarterly
Calcium	mg/L	Quarterly
Sodium	mg/L	Quarterly
Perchlorate	mg/L	Quarterly

\* - Use analysis referenced in Table 4

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Table 4 – Specific Metals Analysis	
Arsenic	USEPA Method 7062
Barium	USEPA Method 6010B
Cadmium	USEPA Method 7131A
Chromium	USEPA Method 6010B
Copper	USEPA Method 6010B
Lead	USEPA Method 7421
Mercury	USEPA Method 7471A
Nickel	USEPA Method 7521
Selenium	USEPA Method 7742
Thallium	USEPA Method 7841
Vanadium	USEPA Method 6010B
Zinc	USEPA Method 6010B

## INFORMATION SHEET

ORDER NO. R5-2005-0164

USECC GOLD LIMITED LIABILITY COMPANY, SUTTER GOLD MINING COMPANY,  
SUTTER GOLD MINING INC., US ENERGY CORP, AND PROPERTY OWNERS  
LINCOLN MINE PROJECT  
CONSTRUCTION OF WASTE PILES AND EXPANDED MINING OPERATIONS  
AMADOR COUNTY

The Sutter Gold Mining Company submitted a Report of Waste Discharge to reopen an existing underground gold mine. The mine will be owned and operated by Sutter Gold Mining Company. The 574 acres of land which makes up the mine property are owned by USECC Gold Limited Liability Company and a number of other identities (listed in Finding No. 3). These land owners are jointly referred to as the "Property Owners." For purposes of this Order, USECC Gold Limited Liability Company, Sutter Gold Mining Company, Sutter Gold Mining Inc., U.S. Energy Corp., and the Property Owners are jointly referred to as "Discharger."

This proposed underground gold mine and processing facility will generate both liquid and solid waste streams that pose a threat to water quality. The underground mining will remove highly mineralized ore veins along with the surrounding host rock. Following the blasting, the newly fragmented waste rock and host rock with ore will be loaded into carts for transportation to two lined processing piles near the mill. The waste rock will be separated from the ore and placed on a lined waste pile. The host rock with ore will then be crushed and the high-grade ore will be concentrated for metals separation at another facility (outside the state of California). The remaining material will be separated based on size for two different disposal procedures. The finer mine waste material (less than 325 mesh) will be slurried and then conveyed through a pipeline to a seven-acre waste pile (surface fill unit) for discharge. The waste material greater than sand size (greater than 325 mesh) will be encapsulated in a 5% Portland cement slurry and placed in the underground workings as an engineered structural support in the excavation from which the ore has been extracted (stope).

The Sutter Gold property is within the western Mother Lode gold district of the Sierra Nevada Mountains. The local relief of the property is approximately 400 feet, which is an estimate of the change in elevation from above the proposed tailings pond to the lowest point beneath the mill area. The present mine workings consist of the Stringbean Alley Decline, a 2,850 foot long tunnel that is a 12 foot high by 15 foot wide tunnel with a 12% decline. From this decline, approximately 1,700 feet of tunnels branch out in which numerous exploration holes have been drilled.

### **Waste Characterization**

The country rock, which is mine waste rock, is classified as a Group B mining waste. This material will be placed on a Title 27-engineered lined waste pile. The two other waste streams (less than 325 mesh and greater than 325 mesh) are also considered mining waste rock after the high-grade ore is removed. This waste material is none acid generating. However, gold deposits in the 'California Mother Lode' are associated with sulfide ore bodies containing elevated metals such as arsenic, nickel, and selenium. Dewatering of mines, and bringing ore and wall rock to the surface, exposes (a) the underground workings, (b) the surrounding rock formations, and (c) the mined material to oxygen. This causes the sulfide minerals to oxidize, making their associated metals soluble and producing salts

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such as sulfate. These metals and salts are then available to dissolve into water posing a significant threat to groundwater and surface water quality. Because of the time it takes for sulfide minerals to oxidize and the extended water contact time at the mine, the standard analyses completed as part of the RWD do not accurately represent the threat to water quality. However, based on the February 1999 U.S. EPA document "*Characterization of Mine Leachate and the Development of a Ground-Water Monitoring Strategy for Mine Sites*," and on impacts seen at other mines in the Mother Lode, the mining and mine waste at this site could or will produce nonhazardous soluble pollutants at concentrations which exceed water quality objectives. Therefore, both waste streams are Group B mining waste. Group B mining waste, as defined in Title 27, is "mining wastes that consist of or contain nonhazardous soluble pollutants of concentrations which exceed water quality objectives for, or could cause, degradation of waters of the state".

### Group B Mining Units

The country rock will be placed onto an engineered liner that complies with Title 27. This design of this unit is equivalent to the prescriptive standard described in Chapter 7 of Title 27. The design of the waste pile consists of, from the top down:

- a. 12-inches of poorly graded gravel, or equivalent with 4-inch schedule 80 perforated drainpipes wrapped in a single layer geo-fabric as a leachate collection and recovery system.
- b. 12-inches of clay at a relative compaction of 90 percent, or equivalent with a minimum hydraulic conductivity of  $1 \times 10^{-7}$  cm/sec.
- c. 12-inches of poorly graded gravel, or equivalent with 2-inch schedule 80 perforated drainpipes wrapped in a single layer geo-fabric as a leachate collection and recovery system.
- d. An engineered compacted subgrade having all slopes rolled with a smooth drum compactor to eliminate soft spots and protruding rocks.

All leachate derived from the waste rock pile will be drained and captured in a HDPE single lined detention basin. Once captured, the water will be immediately returned to the mill for use in the ore extraction process.

The less than 325 mesh mining waste is being placed as slurry into a Group B mining waste pile unit (surface fill unit). This design of this unit is equivalent to the prescriptive standard described in Chapter 7 of Title 27. The design of the surface fill unit consists of, from the top down:

- a. A blanket leachate collection and removal system, designed constructed and operated in compliance with Title 27 Subsection 20340;



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- b. A geomembrane liner;
- c. A geosynthetic clay liner;
- d. A nonwoven geotextile; and
- e. An engineered compacted subgrade having all slopes rolled with a smooth drum compactor to eliminate soft spots and protruding rocks prior to installation of the nonwoven geotextile.

For the greater than 325 mesh mining waste, the Discharger has proposed an engineered alternative to the prescriptive liner requirement of Title 27 Group B containment. The Discharger will encapsulate the material in a 5% concrete slurry and place it in the underground workings as an engineered structural support in the stopes. The dimensions of each encapsulated block will be approximately 200' long, 9' in height and 4' to 10' wide. The actual size of each structural block will be dependent of the size of the mineralized zone. These blocks will be stacked on top of each other as a support column. A geonet drainage layer will be placed between the blocks to allow for drainage. Any standing water will be removed and returned to the mill as process water or discharged to land under Waste Discharge Requirements Order No. 99-035 (or subsequent Order). The addition of 5% concrete slurry to the waste will prevent any significant water flow through the waste and affords equivalent protection against water quality impairment to the prescriptive standard.

### **Other Issues**

#### **Dewatering the Underground Mine Workings**

During mining activities, the groundwater table will be lowered through pumping. This activity will allow the wall rock and the ore zone to react with oxygen, forming oxides. This is typical of acid mine drainage reactions. However, the wall rock in this area has carbonate minerals, which buffer the low pH generation. If groundwater is allowed to rise back up after mining ceases, the groundwater will come into contact with the oxidized wall rock and ore zone and will dissolve these oxides. This will cause an increase in salts and metals (such as sulfate and arsenic), degrading the groundwater.

This Order requires the Discharger to dewater the mine indefinitely to prevent groundwater from rising back into the mine and into the surrounding wall rock, causing the oxidized minerals to dissolve into groundwater. The Discharger has stated that groundwater flows are very low in this area because of the massive nature of the surrounding formations, and has provided evidence that sustained groundwater yield in this area is below 200 gallons per day. However, additional data is required to support this assertion. If at some time in the future, the Discharger determines that it no longer wishes to dewater the mine in perpetuity, then it may elect to submit a proposal to amend the Basin Plan to de-designate the local groundwater's municipal supply beneficial use. If the Regional Board adopts a Basin Plan amendment and revises the WDRs, then the Discharger would be allowed to cease dewatering the mine. However, if and until this happens, the mine must be dewatered.

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**Water Quality Protection Standards**

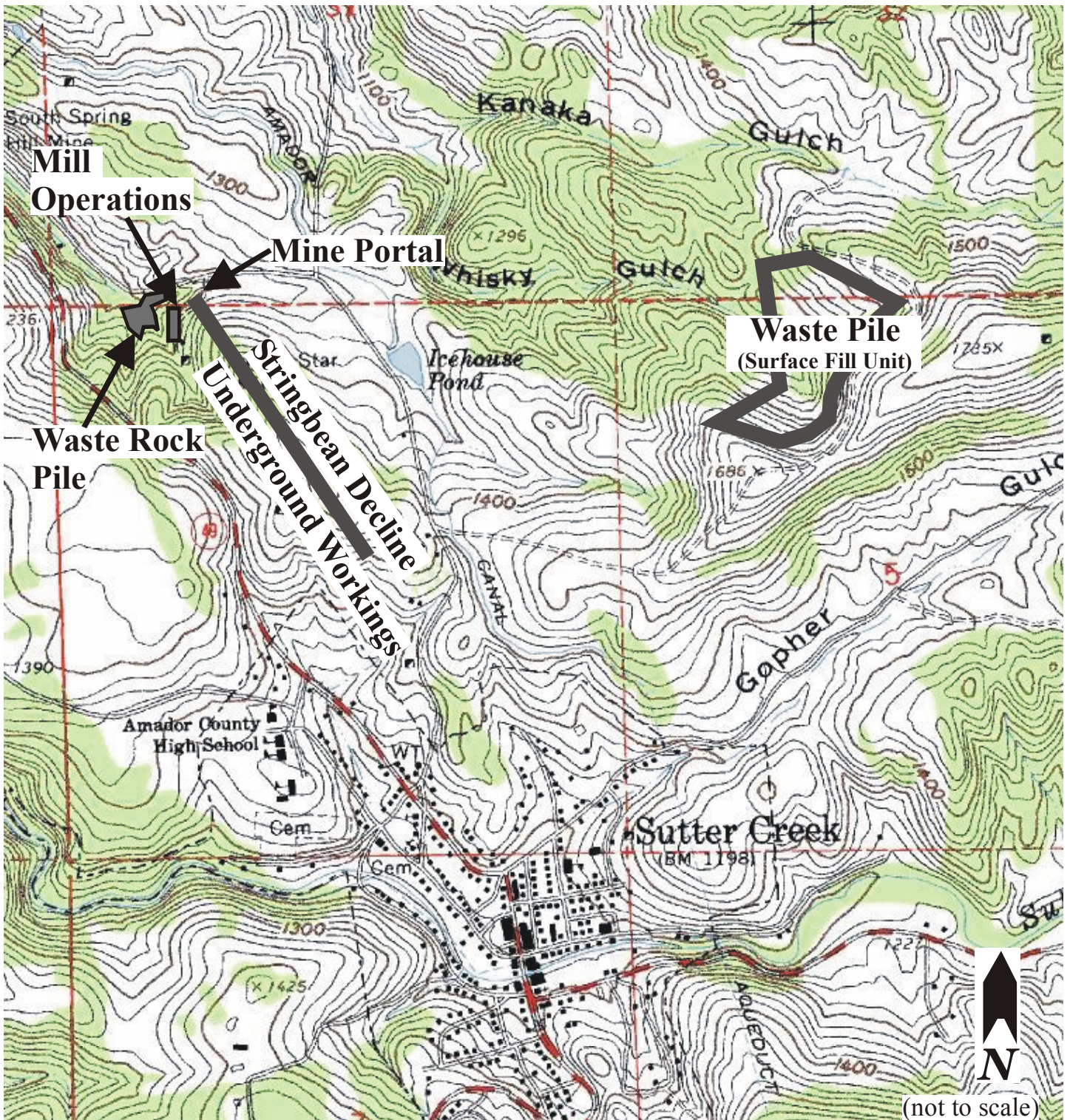
Water quality protection standards per Title 27 have not been established for either of the Group B mining waste units. This Order requires water quality protection standards be established before any waste is discharged into these units and will consist of the list of constituents of concern (under section 20395), the concentration limits (under Title 27 section 20400), and the Point of Compliance and all Monitoring Points (under section 20405). This Water Standard will apply during the active life of the Units, the closure period, the post closure maintenance period, and during any compliance period (under section 20410). Furthermore, these values will represent background water quality for both groundwater and surface water.

**Reopener**

Requirements for discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. Additional information must be developed and documented by the Discharger as required by schedules set forth in the proposed Order. As this additional information is obtained, decisions will be made concerning the ability of the Sutter Gold mining facility to comply with the requirements of discharge. If controls and treatment prescribed by the proposed Order prove insufficient to maintain compliance, Sutter Gold will be required to modify its operations or cease discharge. If modifications represent a significant change to mining operations or design of the mining waste management units, then this will be sufficient basis for reopening the proposed Order.

VJI/WSW: 10/3/05





# Lincoln Mine Project

## Sutter Gold Mining Company

### Site Map





# California Regional Water Quality Control Board

## Central Valley Region



Terry Tamminen  
Secretary for  
Environmental  
Protection

Robert Schneider, Chair

Arnold Schwarzenegger  
Governor

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### ORDER NO. R5-2005-0164 ATTACHMENT 2 REQUIREMENTS FOR MONITORING WELL INSTALLATION WORKPLANS AND MONITORING WELL INSTALLATION REPORTS

Prior to installation of groundwater monitoring wells, the Discharger shall submit a workplan containing, at a minimum, the information listed in Section 1, below. Wells may be installed after staff approve the workplan. Upon installation of the monitoring wells, the Discharger shall submit a well installation report which includes the information contained in Section 2, below. All workplans and reports must be prepared under the direction of, and signed by, a registered geologist or civil engineer licensed by the State of California.

#### SECTION 1 - Monitoring Well Installation Workplan and Groundwater Sampling and Analysis Plan

The monitoring well installation workplan shall contain the following minimum information:

A. General Information:

- Purpose of the well installation project
- Brief description of local geologic and hydrogeologic conditions
- Proposed monitoring well locations and rationale for well locations
- Topographic map showing facility location, roads, and surface water bodies
- Large scaled site map showing all existing on-site wells, proposed wells, surface drainage courses, surface water bodies, buildings, waste handling facilities, utilities, and major physical and man-made features

B. Drilling Details:

- On-site supervision of drilling and well installation activities
- Description of drilling equipment and techniques
- Equipment decontamination procedures
- Soil sampling intervals (if appropriate) and logging methods

C. Monitoring Well Design (in narrative and/or graphic form):

- Diagram of proposed well construction details
  - Borehole diameter
  - Casing and screen material, diameter, and centralizer spacing (if needed)
  - Type of well caps (bottom cap either screw on or secured with stainless steel screws)
  - Anticipated depth of well, length of well casing, and length and position of perforated interval

***California Environmental Protection Agency***

- Thickness, position and composition of surface seal, sanitary seal, and sand pack
- Anticipated screen slot size and filter pack

D. Well Development (not to be performed until at least 48 hours after sanitary seal placement):

Method of development to be used (i.e., surge, bail, pump, etc.)

Parameters to be monitored during development and record keeping technique

Method of determining when development is complete

Disposal of development water

E. Well Survey (precision of vertical survey data shall be at least 0.01 foot):

Identify the Licensed Land Surveyor or Civil Engineer that will perform the survey

Datum for survey measurements

List well features to be surveyed (i.e. top of casing, horizontal and vertical coordinates, etc.)

F. Schedule for Completion of Work

G. **Appendix: Groundwater Sampling and Analysis Plan (SAP)**

The Groundwater SAP shall be included as an appendix to the workplan, and shall be utilized as a guidance document that is referred to by individuals responsible for conducting groundwater monitoring and sampling activities.

Provide a detailed written description of standard operating procedures for the following:

- Equipment to be used during sampling
- Equipment decontamination procedures
- Water level measurement procedures
- Well purging (include a discussion of procedures to follow if three casing volumes cannot be purged)
- Monitoring and record keeping during water level measurement and well purging (include copies of record keeping logs to be used)
- Purge water disposal
- Analytical methods and required reporting limits
- Sample containers and preservatives
- Sampling
  - General sampling techniques
  - Record keeping during sampling (include copies of record keeping logs to be used)
  - QA/QC samples
- Chain of Custody
- Sample handling and transport

## **SECTION 2 - Monitoring Well Installation Report**

The monitoring well installation report must provide the information listed below. In addition, the report must also clearly identify, describe, and justify any deviations from the approved workplan.

A. General Information:

Purpose of the well installation project

Brief description of local geologic and hydrogeologic conditions encountered during installation of the wells

Number of monitoring wells installed and copies of County Well Construction Permits

Topographic map showing facility location, roads, surface water bodies

Scaled site map showing all previously existing wells, newly installed wells, surface water bodies, buildings, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details (in narrative and/or graphic form):

On-site supervision of drilling and well installation activities

Drilling contractor and driller's name

Description of drilling equipment and techniques

Equipment decontamination procedures

Soil sampling intervals and logging methods

Well boring log

- Well boring number and date drilled
- Borehole diameter and total depth
- Total depth of open hole (same as total depth drilled if no caving or back-grouting occurs)
- Depth to first encountered groundwater and stabilized groundwater depth
- Detailed description of soils encountered, using the Unified Soil Classification System

C. Well Construction Details (in narrative and/or graphic form):

Well construction diagram, including:

- Monitoring well number and date constructed
- Casing and screen material, diameter, and centralizer spacing (if needed)
- Length of well casing, and length and position of perforated interval
- Thickness, position and composition of surface seal, sanitary seal, and sand pack
- Type of well caps (bottom cap either screw on or secured with stainless steel screws)

E. Well Development:

Date(s) and method of development

How well development completion was determined

Volume of water purged from well and method of development water disposal

Field notes from well development should be included in report

F. Well Survey (survey the top rim of the well casing with the cap removed):

Identify the coordinate system and datum for survey measurements

Describe the measuring points (i.e. ground surface, top of casing, etc.)

Present the well survey report data in a table

Include the Registered Engineer or Licensed Surveyor's report and field notes in appendix